

## **Abstract of the Invention**

The present invention provides methods for precise and economical indication of overheated component of railway wheel set assembly.

The methods comprise:

(1) embedding a highly thermal conductive element to help monitor directly internal condition of a possible overheated axle / bearing assembly within the railway wheel set assembly.

The highly thermal conductive element, preferably with incorporated heat pipe means, may be in form of

- A. a cap screw mounted to end of the axle or;
- B. a cartridge like label carrier embedded in a hole inside bearing adapter;

(2) attaching, encapsulating and sealing permanently a non-reversible temperature indicating label, preferably a multiple-temperature type, at outside visible end of the highly thermal conductive elements that is readily accessible for quick inspection;

(3) embedding additional highly thermal conductive element and additional non-reversible temperature indicating labels in the wheel hub or brake disc, preferably with incorporated heat pipe means, to help determine positively if wheel or brake disc is overheated or the axle / bearing assembly is overheated.